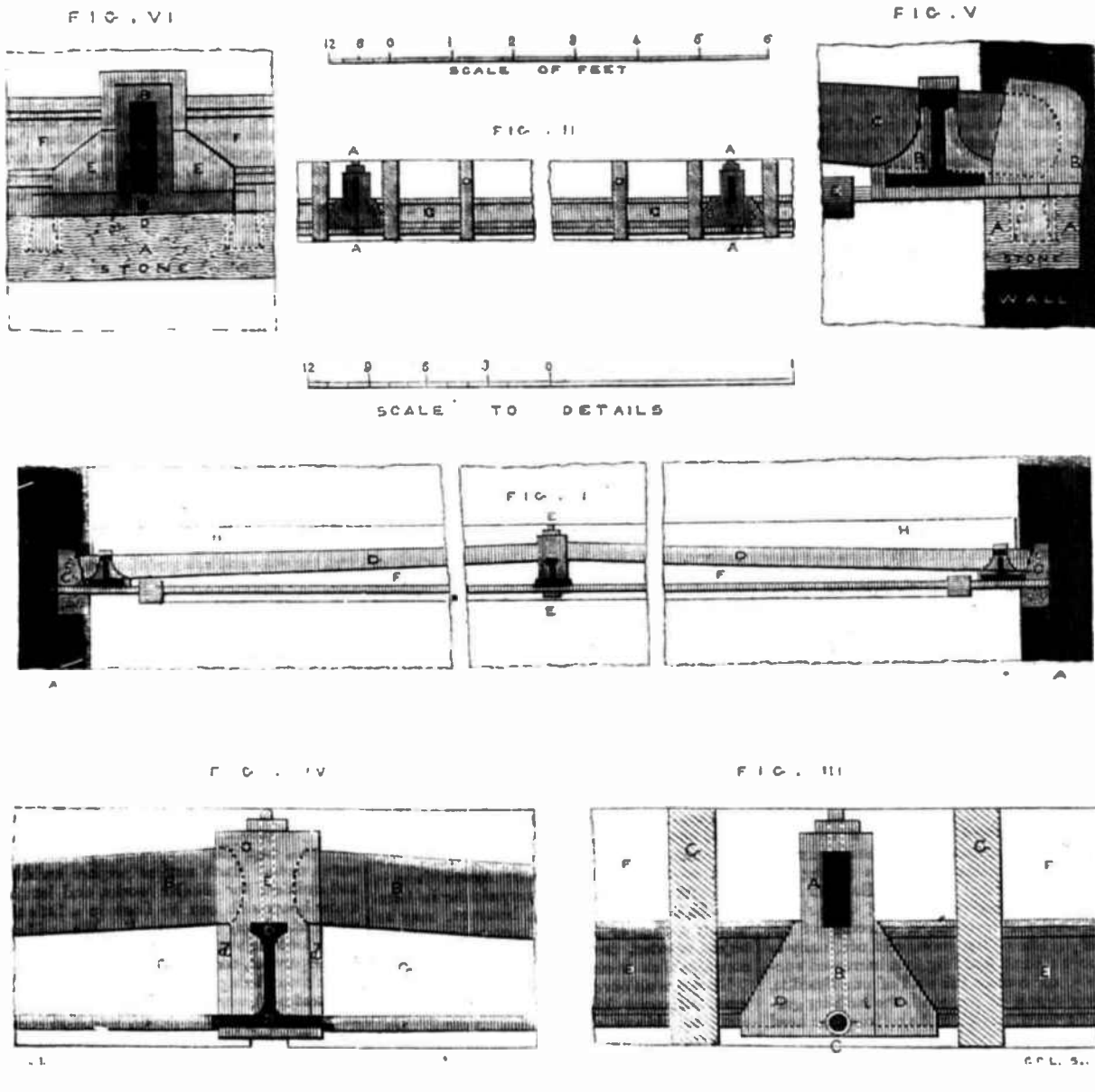


## TRUSSED GIRDER FOR FLOORS.



## CONSTRUCTION OF FLOORS.

SIR.—Since the time of Nicholson and Tredgold, no one has attempted practically to elucidate the principles of construction generally as applied to building purposes, though, since they wrote, extensive improvements have taken place. Adverting to carpentry, the works of the before-named authors treated in their time so ably, on the advantages of scientific construction as applied to practical carpentry, that for some time they left little or no room for others, but as science has made rapid strides towards perfection, it cannot for a moment be supposed that so important a branch of the mechanical art as we are alluding to should remain in *status quo*. Without any intention of endeavouring to supply the deficiency, the following may not be without value to a certain class of your readers, although perhaps others may view it impatiently.

The carpenter who understands his trade must have devoted considerable time and application to acquire that information, and it frequently occurs that to him is intrusted the management of carrying out the architect's designs. The mason, the bricklayer, and other artisans must study the most practical, efficient, and economical means of working and applying their various materials, but the business of the carpenter being so connected with practical geometry, to him usually the others apply for the making of the centre-moulds, fixing the

bond timber, and other matters connected with the construction of a building.

Geometry being the science which considers the properties of lines and angles, as formed according to some given law, also the construction of figures corresponding with given data, it is requisite that the mechanic should make himself thoroughly acquainted with it.

Without the aid of this branch of knowledge, he will be unfit for any undertaking whatever, and so long as he is ignorant of the methods of geometrical construction, he must remain under the control and direction of a superior in his own class. The uses of geometry are not confined to carpentry. Indeed, there is no mechanical profession that does not derive considerable advantage from it. One workman is superior to another in proportion to his knowledge of it.

By practical geometry and architectural dynamics, our predecessors in the art of building discovered the way in which their materials were affected by gravity, and were enabled to economise them and reduce their quantity; yet many of their edifices, after 500 years, are more sound than some modern buildings which have not subsisted fifty years, and which contain five times their quantity of material.

It frequently occurs that the carpenter evinces great sagacity in the use of temporary shores and strutting, while buildings are being underpinned and repaired or altered, and it is strange that the same person who exhibits this sagacity,

and who finds out pretty correctly which way the force of gravity will move during the temporary jeopardy of old buildings, should so entirely neglect the means requisite for preventing those extensive derangements which leave many of our new buildings, intended to be permanent, mere heaps of ruin, warped, cracked, and distorted.

A late esteemed author states that a child, by delicacy of hand, poise and counterpoise, without cement, tenon, joints, or glue, can raise up a fabric of cards, but the grown builder, staggered and lost amid his mortar, cement, tenons, spikes, holdfasts, nails, screws, glue, cramps, and braces, forgets that providence by which a small quantity of material may be made to hold up firmly without any of these additional means of union.

The ancients piled up the stones composing many of the best works of their day without cement or such auxiliaries, and several of them still exist without flaw.

Cements or pegs made use of in a fabric, the materials of which would, without them, by gravity, assume some distorted form, are less employed for strength than to counteract the ignorance of the fabricator. These things should be used to make a small quantity of materials rightly placed perform the same duty as a larger quantity of them would without such aids.

In the basement story of a building, if the walls be strong and the foundations good,